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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/589,064	06/08/2000	Nobuhiro Tani	P19212	1395

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EXAMINER	
LONG, HEATHER R	
ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 06/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/589,064	TANI, NOBUHIRO	
	Examiner	Art Unit	
	Heather R. Long	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-19,21 and 23-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13,14,19,21,23 and 24* is/are allowed.

6)☒ Claim(s) *12,15-18,25 and 26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 June 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's arguments with respect to claims 12, 15-18, 25, and 26 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 12 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malek (U.S. Patent 4,915,498) in view of Yahav et al. (U.S. Patent 6,057,909) in view of Norita et al. (U.S. Patent Application Publication 2003/0137674).

Regarding claim **12**, Malek discloses a three-dimensional image capturing device, comprising: a light source that radiates a distance measuring light beam irradiating a measurement subject, the measurement subject reflecting the distance measuring light beam to generate a reflected light beam (transmitter element 14); a plurality of photoelectric conversion elements, that receive the reflected light beam, the photoelectric conversion elements accumulating electric charge corresponding to at least distance information based on an amount of the received reflected light beam (element 15 shown in Fig. 1 and in particular element 9); a vertical transfer unit that is disposed along each vertical line of the photoelectric conversion elements, the photoelectric conversion elements transferring the accumulated electric charge in a vertical direction (having vertical CCDs to transfer charge vertically is with a CCD imaging device); a horizontal

transfer unit that is disposed near one end of the vertical transfer and in parallel with horizontal lines of the photoelectric conversion elements, so that the electric charge is transferred in a horizontal direction (having horizontal CCDs to transfer charge horizontally is with a CCD imaging device); an electric charge transfer processor that transfers electric charge accumulated only in photoelectric conversion elements comprising effective horizontal lines (all the lines are effective), which are disposed every predetermined number of the horizontal lines, wherein the predetermined number is 1, (the signal charge transfer processor is also an feature of a CCD in order to transfer charges from pixels to the vertical CCDs); and a transfer operation control processor that controls the horizontal transfer unit and the vertical transfer unit, so that the horizontal transfer unit is driven only when the electric charge corresponding to the effective horizontal lines is transferred to the horizontal transfer unit (Malek: Fig. 1, reference character "4"). However, Malek fails to disclose an electric charge integrating processor that drives the electric charge transfer processor repeatedly and integrates the electric charge accumulated in the photoelectric conversion elements comprising the effective horizontal lines in the vertical transfer unit as well as the effective horizontal lines being disposed every predetermined number of horizontal lines, wherein the predetermined number being at least equal to two.

Referring to the Yahav et al. reference, Yahav et al. discloses that the integration of distance measurement charges can be performed multiple times in

a field period in order to increase the signal/noise ratio of the image (col. 3, lines 25-39).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have performed Malek's distance measurement operation multiple times in one field in order to increase the signal/noise ratio of the image. However, Malek in view of Yahav et al. fails to disclose that the effective horizontal lines are disposed every predetermined number of horizontal lines, wherein the predetermined number being at least equal to two.

Referring to the Norita et al. reference, Norita et al. discloses three different types of distance image sensors allowing random access on a row by row basis, which can be applied to reduce necessary input time to the three-dimensional measuring apparatus (paragraph [0161]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the teaching of reading out the image sensor on a row by row basis as taught by Norita et al. to the three-dimensional image capturing device as disclosed by Malek in view of Yahav et al. in order to reduce the necessary input time.

Regarding claim **15**, Malek in view of Yahav et al. in view of Norita et al. discloses all the limitations as previously discussed with respect to claim 12 as well as disclosing a device further comprising an electric charge discharging processor that starts accumulating the electric charge in the photoelectric

conversion elements by discharging unwanted charge accumulated in the photoelectric conversion elements (Malek: col. 8, lines 6-8). Further note that a clear, integrate, and read operation are implied in Malek's disclosure through the description of the clear operation. Therefore, the electric charge discharging processor and transfer processor would be operated alternately as claimed.

Regarding claim **16**, Malek in view of Yahav et al. in view of Norita et al. discloses all the limitations as previously discussed with respect to claims 12 and 15 including that the photoelectric conversion elements are formed on a substrate and the electric charge discharging processor discharges the unwanted charge to the substrate. It is well known in the art to form the photoelectric conversion elements of a CCD on a substrate, wherein unwanted charges are discharged to the substrate. This is typically performed through the use of an overflow drain (OFD). It is further known to use an OFD in order to suppress blooming in an image sensor. Official Notice is taken. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added an OFD to Malek's CCD in order to suppress blooming.

Regarding claim **17**, Malek in view of Yahav et al. in view of Norita et al. discloses all the limitations as previously discussed with respect to claims 12, 15 and 16. Furthermore, it is clear in Malek in view of Yahav et al. in view of Norita et al. that charge accumulation begins after the resetting operation in order to generate a subsequent image.

Regarding claim **18**, Malek in view of Yahav et al. in view of Norita et al. discloses all the limitations as previously discussed with respect to claims 12 and 15-17 including that the light source radiates a pulsed beam of the distance measuring light beam during a first accumulating period (Malek: col. 7, lines 46-50), which is from an output of the electric charge discharging signal to an output of the electric charge transfer signal, and the electric charge corresponding to distance information regarding the measurement subject is integrated in the vertical transfer unit of the effective horizontal lines (Malek: Figs. 3c and 3d; Yahav et al.: col. 3, lines 25-39).

4. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malek in view of Yahav et al. in view of Norita et al. as applied to claim 12 above, and further in view of Roberts (U.S. Patent 5,541,654).

Regarding claim **25**, Malek in view of Yahav et al. in view of Norita et al. fails to disclose a device wherein the horizontal lines are separated into a plurality of groups and the effective horizontal lines comprise at least one of the groups.

Referring to the Roberts reference, Roberts discloses a device wherein the horizontal lines are separated into a plurality of groups and the effective lines comprise at least one of the groups (Fig. 6) (col. 10, lines 9-21). It is implicit that any number of groups may be formed in order to scan the pixels at a higher frame rate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teachings as disclosed by Roberts to the three-dimensional image capturing device as taught by Malek in view of Yahav et al. in view of Norita et al. in order to further scan the pixels at a higher frame rate by only scanning groups of pixels compared to the whole image.

Regarding claim **26**, Malek in view of Yahav et al. in view of Norita et al. in view of Roberts discloses a device wherein each of the plurality of groups shares at least one of the horizontal lines (see claim 25).

Allowable Subject Matter

5. Claims 13, 14, 19, 21, 23, and 24 are allowed for reasons stated in previous office actions dated February 5, 2004 and October 20, 2004.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather R. Long whose telephone number is 571-272-7368. The examiner can normally be reached on Mon. - Thurs.: 7:00 am - 4:30 pm, and every other Fri.: 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on 571-272-7593. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Heather R Long
Examiner
Art Unit 2615

HRL

DAVID L. OMETZ
PRIMARY EXAMINER